

# ANACONDA C-HILL

## DEER LODGE COUNTY

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The C-Hill air monitoring site was located approximately 1 mile south of Anaconda at 46° 06' 03" N and 112° 56' 56" W (Site No. 27 on Map II-1). Elevation at the site was 7,193 feet. The site was established by the Anaconda Copper Company to measure concentrations of sulfur dioxide.

The land around the site is very rugged. To the southwest the Anaconda Range rises to more than 11,000 feet. To the north is the Flint Creek Range, with summits over 10,000 feet. The area is dissected by many deep canyons.

The Anaconda Copper Company owns the land around the site, so access is restricted. In general, land in the valleys is privately owned, and land in the mountains is controlled by the U.S. Forest Service. Several major electrical transmission lines run through the Deer Lodge valley. The nearest commercial airport is the Anaconda airport, about 5 miles northeast of the site.

Wind data from January 1, 1976, through May 31, 1979, were available for analysis. The data set consists of hourly averages of wind speed and wind direction manually reduced from stripchart records. Anemometer height was 10 meters.

Data recovery ranged from 39.4 percent in March to 91.7 percent in December. Overall data recovery was 59.6 percent.

Wind monitoring was conducted long enough to adequately represent the wind resource at this location. Because of the region's complex terrain, however, the data are representative only of a small area in the immediate vicinity of the site, which is on the crest of a high ridge. The rugged nature of the site limits the possibilities for development.

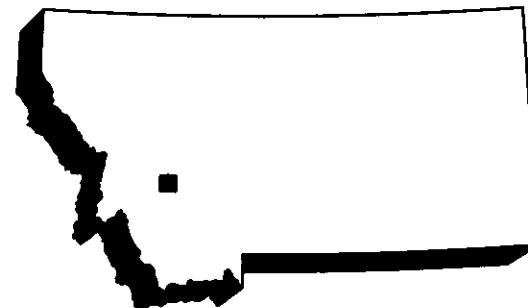
Average annual wind speed at this site was 13.3 miles per hour. Average monthly wind speeds ranged from 9.8 miles per hour in July to 17.5 miles per hour in December.

Average monthly wind power varied from 106.6 watts/m<sup>2</sup> in July to 618.3 watts/m<sup>2</sup> in December. Average annual wind power was 279.8 watts/m<sup>2</sup>.

Average seasonal wind speeds were 11.2 miles per hour in summer, 11.4 miles per hour in autumn, 14.2 miles per hour in spring, and 15.4 miles per hour in winter. During all seasons the average wind speed was highest during the afternoon hours. In spring and summer, the highest average wind speeds occurred later in the afternoon (1700 and 1600 MST, respectively) than in the other two seasons. Average wind speeds were lowest from about 0700 to 0800 MST during all seasons except autumn, when the lowest average speeds occurred at 0400 MST.

The diurnal range of average hourly speeds was greatest in summer and least in winter. Most of the differences in average wind speeds among the seasons were due to variations in the average nighttime wind speed.

The annual wind rose distribution shows that winds were most common from the west to south-southwest. Winds from the north-northwest through north-northeast were least common. The highest average wind speeds, 14 to 19 miles per hour, were recorded for winds from the south-southwest through west. The lowest average speeds, less than 6 miles per hour, were recorded for winds from the north through north-northeast.



**Table IV - 43**  
**Monthly Wind Speed Distribution**  
**DEER LODGE COUNTY - ANACONDA C-HILL**  
**01/01/76 - 05/31/79**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
CALM	0.1	0.1	0.3	1.2	0.2	0.1	0.5	0.1	0.5	0.6	0.3	0.1	0.4	CALM
0.1-1.0	1.5	1.0	0.4	0.3	0.6	0.3	0.7	0.2	0.6	1.0	0.5	0.5	0.7	0.1- 0.4
1.1-2.0	3.5	2.1	1.4	2.1	1.1	1.5	3.2	2.2	3.2	2.9	2.8	1.2	2.2	0.5- 0.9
2.1-3.0	3.4	2.9	2.8	3.2	2.1	3.0	5.5	3.3	5.1	5.0	4.7	1.9	3.5	1.0- 1.3
3.1-4.0	4.8	3.4	2.8	3.5	3.5	2.8	6.0	5.0	4.6	5.8	5.5	3.2	4.2	1.4- 1.8
4.1-5.0	4.5	3.5	3.3	4.8	3.2	5.9	7.9	5.2	5.2	6.4	6.3	3.5	4.8	1.9- 2.2
5.1-6.0	5.0	4.1	3.6	4.5	4.8	5.6	7.7	7.2	6.0	6.0	6.1	3.2	5.1	2.3- 2.7
6.1-7.0	5.7	3.8	3.9	4.6	4.5	6.1	7.8	7.5	5.9	7.0	6.7	3.4	5.4	2.8- 3.1
7.1-8.0	5.2	3.6	4.4	5.1	4.7	6.1	6.4	7.2	5.7	6.0	4.5	3.8	5.1	3.2- 3.6
8.1-9.0	5.2	2.9	4.6	5.5	5.5	5.6	6.8	7.4	6.2	4.7	4.8	3.9	5.2	3.7- 4.0
9.1-10.0	5.1	3.6	4.3	3.9	4.9	6.0	6.2	6.3	5.7	4.9	5.0	3.8	4.9	4.1- 4.5
10.1-11.0	5.4	3.7	4.4	3.9	5.2	5.6	5.3	5.7	5.8	4.4	5.9	4.5	4.9	4.6- 4.9
11.1-12.0	5.0	3.9	5.0	4.8	5.5	4.4	5.1	5.9	5.2	4.4	4.5	4.5	4.9	5.0- 5.4
12.1-13.0	4.8	3.7	4.0	4.0	5.8	4.8	3.9	5.3	4.6	3.5	3.9	3.4	4.3	5.5- 5.8
13.1-14.0	5.1	3.4	3.6	3.6	4.7	3.8	4.5	4.1	4.2	4.1	6.1	4.3	4.3	5.9- 6.3
14.1-15.0	4.4	3.6	3.3	3.4	4.5	3.6	3.2	3.1	4.0	4.3	3.4	4.3	3.9	6.4- 6.7
15.1-16.0	3.6	3.0	4.3	2.8	3.8	3.2	2.9	2.7	3.3	3.8	3.2	3.7	3.4	6.8- 7.2
16.1-17.0	3.1	3.5	4.1	3.8	3.9	3.0	2.4	3.1	4.0	3.2	2.7	3.2	3.4	7.3- 7.6
17.1-18.0	2.6	2.9	4.7	3.1	3.6	3.1	1.4	3.7	2.7	3.3	2.5	2.7	3.0	7.7- 8.0
18.1-19.0	2.8	3.4	3.1	3.9	3.8	3.0	1.3	2.0	2.1	2.1	3.0	3.7	2.9	8.1- 8.5
19.1-20.0	2.3	2.5	4.2	3.2	3.1	2.5	1.5	2.3	3.0	2.0	2.0	2.7	2.6	8.6- 8.9
20.1-25.0	8.6	14.5	12.8	12.9	13.3	10.9	7.0	6.6	9.2	9.4	8.6	12.3	10.7	9.0-11.2
25.1-30.0	4.1	10.5	6.7	6.7	5.6	5.9	1.6	2.5	2.2	3.0	3.2	7.7	5.1	11.3-13.4
30.1-35.0	1.6	5.7	3.3	3.3	1.4	2.0	0.6	0.9	0.8	1.4	1.7	6.2	2.5	13.5-15.6
35.1-40.0	0.9	2.0	1.9	1.4	0.5	0.9	0.2	0.4	0.2	0.7	0.9	3.2	1.2	15.7-17.9
>40.0	1.6	2.7	2.7	0.7	0.1	0.4	0.2	0.1	0.2	0.2	1.2	5.2	1.4	>17.9
AVERAGE SPEED (MPH)	12.5	16.5	15.5	14.0	13.6	13.0	9.8	10.9	11.2	11.3	11.9	17.5	13.3	
AVERAGE SPEED (M/SEC)	5.6	7.4	6.9	6.3	6.1	5.8	4.4	4.9	5.0	5.1	5.3	7.8	6.0	
AVERAGE WIND POWER (WATTS/MM**2)	264.5	491.5	410.5	290.0	215.6	223.5	106.6	129.8	145.4	169.1	226.3	618.3	279.8	
PERCENT DATA RECOVERY	72.3	46.5	39.4	59.0	74.4	49.2	45.6	47.8	71.1	73.6	44.4	91.7	59.6	

ANEMOMETER HEIGHT = 10 METERS = 33 FEET

NUMBER OF OBSERVATIONS = 23061

PERCENTAGE DATA RECOVERY = 59.6

SOURCE: GEORESEARCH, INC.

**Table IV - 44**  
**Percentage Frequency Summary for Wind Speed**  
**DEER LODGE COUNTY - ANACONDA C-HILL (WINTER)**  
**01/01/76 - 05/31/79**

	CALM	WIND SPEED (MPH)															AV SPEED (MPH)	AV SPEED (M/SEC)	
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0	>40.0			
		0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9			
1	0.0	5.9	3.8	10.4	6.9	9.4	9.4	8.3	6.9	4.9	8.0	10.1	6.9	3.8	2.8	2.4	15.0	6.7	
2	0.3	3.1	6.2	4.8	11.4	9.0	11.8	4.8	6.9	6.9	7.6	10.0	7.6	3.5	1.4	4.5	15.7	7.0	
3	0.3	2.8	7.3	6.9	9.0	12.1	9.0	9.0	8.0	6.2	4.2	9.3	4.8	4.5	2.4	4.2	15.1	6.8	
4	0.0	4.5	6.2	6.9	9.3	9.3	10.0	11.7	7.2	6.2	6.5	7.2	4.5	4.5	1.4	4.8	14.9	6.7	
5	0.3	4.8	6.5	5.5	10.6	8.9	8.6	11.0	10.6	6.2	2.1	9.6	5.5	4.1	1.4	4.5	15.0	6.7	
6	0.0	3.1	6.2	11.0	8.9	8.6	10.3	6.8	7.9	4.5	6.5	10.6	4.5	5.1	3.1	3.1	15.1	6.8	
7	0.0	4.5	6.2	10.3	11.3	6.5	13.0	7.2	8.2	2.7	5.1	9.2	5.8	4.5	1.7	3.8	14.6	6.5	
8	0.3	2.4	7.9	7.9	9.3	7.6	10.7	9.7	6.6	5.9	6.6	9.3	5.5	4.1	2.1	4.1	15.1	6.8	
H	9	0.0	3.1	7.3	7.3	9.8	9.1	7.0	10.5	9.8	4.9	5.9	11.1	5.2	3.1	2.1	3.8	15.1	6.8
O	10	0.3	2.1	7.7	10.1	5.6	7.7	12.5	8.4	8.4	8.7	4.9	10.5	4.5	3.5	1.0	4.2	14.9	6.7
U	11	0.0	2.1	8.3	10.1	5.9	6.9	10.1	8.3	7.3	9.7	6.9	10.8	5.2	3.8	0.7	3.8	15.1	6.8
R	12	0.3	3.8	5.9	7.2	9.7	5.5	9.3	9.0	8.3	4.8	7.9	13.1	5.9	4.1	2.1	3.1	15.5	6.9
	13	0.0	2.1	4.8	8.3	8.3	7.9	7.2	10.7	5.2	5.9	4.5	17.2	7.9	3.1	3.8	3.1	16.5	7.4
	14	0.0	2.1	5.6	5.6	7.6	10.1	7.6	7.6	6.3	6.9	6.3	16.3	9.0	2.8	3.5	2.8	16.7	7.5
	15	0.0	3.8	2.4	6.9	10.0	7.6	8.3	6.6	4.8	8.6	6.2	14.8	10.3	6.6	0.7	2.4	16.5	7.4
	16	0.0	3.4	4.8	8.2	7.1	8.5	7.8	6.1	8.2	8.5	5.1	11.9	11.6	4.4	2.4	2.0	16.2	7.2
	17	0.0	2.7	7.8	8.1	10.5	4.7	8.1	6.8	7.5	6.1	6.8	13.2	7.1	5.8	3.1	1.7	15.6	7.0
	18	0.3	2.7	7.8	7.8	7.8	9.6	8.2	6.8	7.8	5.8	6.5	11.9	7.5	3.1	2.4	3.8	15.4	6.9
	19	0.3	2.7	9.9	6.8	7.8	8.2	8.8	8.2	7.5	5.1	6.1	8.8	9.5	6.1	2.4	1.7	15.2	6.8
	20	0.0	3.8	8.2	9.6	7.5	7.8	7.5	9.6	7.5	5.1	5.8	9.9	7.5	5.8	1.7	2.7	15.0	6.7
	21	0.0	3.1	9.2	6.4	8.1	11.2	8.5	7.1	9.5	4.4	6.1	10.2	9.5	2.7	1.0	3.1	14.8	6.6
	22	0.0	3.1	6.8	11.2	7.8	7.8	6.8	8.1	9.5	5.8	4.7	12.5	6.4	4.7	2.0	2.7	15.1	6.7
	23	0.3	3.4	5.7	7.1	7.8	9.5	10.8	11.5	6.1	4.7	2.0	13.5	6.8	6.4	2.4	2.0	15.4	6.9
	24	0.0	4.8	5.4	6.5	10.9	8.8	10.2	7.5	8.2	4.1	5.4	12.2	7.8	3.7	1.4	3.1	15.0	6.7
ALL HOURS		0.1	3.3	6.6	8.0	8.7	8.4	9.2	8.4	7.7	5.9	5.7	11.4	7.0	4.3	2.0	3.2	15.4	6.9

SOURCE: GEORESEARCH, INC.

Table IV - 45

## Percentage Frequency Summary for Wind Speed

## DEER LODGE COUNTY - ANACONDA C-HILL (SPRING)

01/01/76 - 05/31/79

	CALM	WIND SPEED (MPH)															AV (MPH)	AV (M/SEC)	
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0	>40.0			
		0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9			
1	1.1	2.3	10.7	13.0	9.6	6.9	8.8	9.6	7.3	7.7	5.0	6.9	6.1	2.3	0.8	1.9	12.7	5.7	
2	0.8	3.5	8.2	10.1	11.3	10.5	9.3	9.7	5.4	7.8	5.1	10.5	3.1	2.7	1.6	0.4	12.6	5.6	
3	0.8	3.1	5.8	10.0	11.5	11.2	13.1	7.3	8.1	6.9	3.8	10.4	3.8	1.9	1.5	0.8	12.7	5.7	
4	0.8	4.9	8.3	9.8	9.5	11.0	11.0	11.4	5.3	7.2	5.7	6.8	4.9	1.9	1.1	0.4	12.2	5.5	
5	1.5	4.2	9.4	7.5	10.6	9.1	10.2	11.7	6.8	6.8	3.8	10.2	5.3	1.1	1.1	0.8	12.5	5.6	
6	1.9	6.1	7.6	8.7	9.8	10.6	11.4	7.2	9.5	5.3	5.3	8.3	4.9	2.3	0.4	0.8	12.2	5.4	
7	0.8	6.5	9.9	9.9	7.2	15.2	9.1	10.3	7.6	5.3	6.1	6.1	3.0	1.9	0.8	0.4	11.4	5.1	
8	1.1	3.4	14.9	9.2	8.8	11.9	12.6	8.0	5.0	5.4	7.7	5.0	3.4	2.3	0.4	0.8	11.4	5.1	
H	9	0.8	1.9	6.9	12.0	11.6	10.8	9.7	10.8	6.2	6.9	5.0	10.4	3.9	1.9	0.4	0.8	12.5	5.6
O	10	0.8	0.4	4.6	9.6	11.2	8.5	12.3	9.6	8.1	7.3	6.9	13.1	4.6	1.5	1.2	0.4	13.7	6.1
U	11	0.4	0.4	3.1	9.9	9.9	9.2	8.8	11.8	7.3	6.5	9.2	14.5	5.3	2.3	0.8	0.8	14.4	6.4
R	12	0.0	0.4	3.0	5.7	7.9	9.1	12.1	10.2	9.8	8.7	6.0	15.8	8.7	0.0	1.5	1.1	15.3	6.8
	13	0.4	1.1	1.1	5.7	8.3	9.8	8.0	7.6	10.6	11.0	6.8	15.5	10.6	1.9	0.4	1.1	15.9	7.1
	14	0.0	0.8	2.7	5.7	7.2	6.8	8.7	9.5	9.8	8.7	8.0	18.2	9.5	2.3	0.4	1.9	16.4	7.3
	15	0.0	0.0	2.6	4.9	7.2	9.1	7.9	10.2	7.2	9.1	13.6	13.2	8.7	3.8	1.9	0.8	16.5	7.4
	16	0.0	0.0	2.2	4.4	9.3	8.5	8.1	8.5	6.3	9.3	7.4	20.7	8.1	5.9	0.4	0.7	16.7	7.5
	17	0.0	0.4	2.6	4.8	4.5	8.9	8.6	7.1	6.7	9.3	8.9	22.3	9.3	4.5	1.9	0.4	17.2	7.7
	18	0.0	0.4	2.6	4.5	7.5	6.3	10.4	9.3	4.5	7.8	14.6	16.0	10.8	3.0	1.5	0.7	16.8	7.5
	19	0.0	1.1	1.9	3.0	10.4	10.4	5.6	9.0	10.8	8.2	8.6	19.0	6.0	2.2	1.9	1.9	16.3	7.3
	20	0.0	0.0	4.1	6.0	11.2	6.7	8.6	7.8	10.4	7.1	8.6	15.7	7.8	3.7	0.7	1.5	15.8	7.1
	21	0.4	0.7	3.7	8.9	10.4	9.7	11.2	7.4	7.1	7.4	8.2	14.1	4.8	3.0	2.6	0.4	14.8	6.6
	22	0.7	0.7	8.6	12.6	8.6	9.3	9.3	5.6	5.9	8.2	5.6	14.5	6.3	2.2	1.1	0.7	13.7	6.1
	23	1.1	3.0	9.3	10.7	9.3	10.4	11.5	5.6	5.2	8.1	4.4	11.1	5.9	1.9	1.5	1.1	13.0	5.8
	24	0.7	1.5	10.0	10.0	7.8	13.3	7.0	8.1	8.1	5.9	4.8	13.7	3.7	3.3	1.1	0.7	13.2	5.9
ALL HOURS	0.6	1.9	6.0	8.2	9.2	9.7	9.7	8.9	7.5	7.6	7.0	13.0	6.2	2.5	1.1	0.9	14.2	6.3	

SOURCE: GEORESEARCH, INC.

**Table IV - 46**  
**Percentage Frequency Summary for Wind Speed**  
**DEER LODGE COUNTY - ANACONDA C-HILL (SUMMER)**  
**01/01/76 - 05/31/79**

	CALM	WIND SPEED (MPH)															AV SPEED (MPH)	AV SPEED (M/SEC)	
		0.1-	2.1-	4.1-	6.1-	8.1-	10.1-	12.1-	14.1-	16.1-	18.1-	20.1-	25.1-	30.1-	35.1-	>40.0			
		2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	30.0	35.0	40.0				
	CALM	0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9			
1	0.0	5.7	11.4	13.6	14.8	14.2	14.2	7.4	7.4	4.0	2.3	4.0	0.6	0.0	0.0	0.6	9.1	4.1	
2	0.0	4.0	11.5	19.5	14.9	15.5	9.2	8.6	4.0	4.0	2.3	4.6	1.1	0.6	0.0	0.0	8.9	4.0	
3	0.6	4.0	14.2	17.0	17.6	13.1	10.8	7.4	4.0	5.7	1.7	1.7	1.7	0.6	0.0	0.0	8.5	3.8	
4	1.7	4.0	14.9	20.6	13.7	13.1	6.3	9.1	5.7	3.4	2.3	4.0	1.1	0.0	0.0	0.0	8.3	3.7	
5	1.1	6.9	16.6	15.4	17.7	8.0	9.7	8.0	5.7	5.1	1.1	3.4	0.0	1.1	0.0	0.0	8.1	3.6	
6	0.6	6.8	17.0	21.6	8.5	10.2	9.1	10.2	6.8	2.3	2.8	1.7	1.7	0.0	0.6	0.0	8.2	3.7	
7	1.7	9.2	17.8	18.4	13.2	11.5	9.2	6.3	3.4	4.0	0.6	2.9	1.7	0.0	0.0	0.0	7.5	3.3	
8	0.0	6.3	15.3	19.3	18.2	14.8	10.2	4.5	2.8	1.7	1.1	4.0	1.7	0.0	0.0	0.0	7.9	3.5	
H	9	0.0	2.3	14.2	21.6	16.5	9.7	10.8	9.7	3.4	5.7	0.6	4.0	1.1	0.6	0.0	0.0	8.7	3.9
O	10	0.0	1.8	8.8	22.2	15.2	12.9	10.5	9.4	4.1	5.3	2.9	5.3	1.2	0.6	0.0	0.0	9.4	4.2
U	11	0.0	0.0	6.3	16.7	18.4	11.5	11.5	10.9	6.9	6.3	4.0	5.2	1.1	0.6	0.0	0.6	10.5	4.7
R	12	0.0	1.1	3.4	8.6	17.1	11.4	12.6	12.6	8.0	4.6	8.0	8.0	3.4	1.1	0.0	0.0	12.1	5.4
	13	0.0	0.0	3.4	9.0	13.6	13.6	11.9	8.5	6.8	6.2	6.8	14.1	4.0	1.1	1.1	0.0	13.3	5.9
	14	0.0	0.0	1.7	5.2	14.0	16.9	10.5	5.2	8.1	7.6	8.7	13.4	6.4	1.2	1.2	0.0	14.1	6.3
	15	0.0	0.0	1.7	4.0	13.1	17.1	10.9	9.7	5.7	4.0	5.7	14.9	9.1	2.9	0.6	0.6	14.7	6.6
	16	0.0	0.0	1.1	2.9	12.6	10.3	10.9	12.1	6.9	8.6	8.6	14.9	5.2	2.9	2.9	0.0	15.5	6.9
	17	0.0	0.6	1.7	6.9	5.2	14.5	11.6	8.7	10.4	5.2	6.9	15.0	9.2	1.7	2.3	0.0	15.4	6.9
	18	0.0	1.1	2.3	5.7	9.7	10.3	12.6	11.4	6.3	6.9	5.1	17.1	7.4	2.3	1.1	0.6	15.1	6.7
	19	0.0	0.0	4.5	4.5	10.7	12.4	13.6	9.0	9.0	7.3	5.1	11.9	6.8	4.0	0.0	1.1	14.5	6.5
	20	0.0	0.6	2.3	8.6	10.9	16.1	9.8	10.3	6.9	5.7	6.9	12.6	6.3	1.7	0.6	0.6	13.8	6.2
	21	0.0	1.7	5.2	14.4	9.2	13.8	9.8	8.0	8.0	8.0	5.7	10.9	2.9	0.6	1.1	0.6	12.5	5.6
	22	0.0	1.7	8.0	12.5	13.6	11.9	9.1	8.0	9.1	6.8	4.5	8.5	4.0	1.7	0.6	0.0	11.8	5.3
	23	0.0	2.8	9.7	9.7	15.3	13.6	12.5	6.3	3.4	8.5	5.7	6.8	2.3	2.3	0.6	0.6	11.4	5.1
	24	0.0	2.9	10.3	17.2	14.9	9.2	9.2	10.3	6.9	6.9	2.3	8.0	0.6	0.6	0.0	0.6	10.2	4.6
ALL HOURS		0.2	2.6	8.5	13.1	13.7	12.7	10.7	8.8	6.2	5.6	4.2	8.2	3.4	1.2	0.5	0.2	11.2	5.0

SOURCE: GEORESEARCH, INC.

Table IV - 47

## Percentage Frequency Summary for Wind Speed

## DEER LODGE COUNTY - ANACONDA C-HILL (AUTUMN)

01/01/76 - 05/31/79

	CALM	WIND SPEED (MPH)															AV SPEED (MPH)	AV SPEED (M/SEC)	
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0	>40.0			
		WIND SPEED (M/SEC)																	
1	0.4	7.0	14.8	15.2	11.3	11.3	8.7	7.8	5.7	5.2	1.3	7.0	1.3	1.7	0.9	0.4	9.9	4.4	
2	1.7	6.1	12.2	14.3	13.0	10.0	9.1	11.7	3.9	4.8	2.2	6.1	2.2	1.7	0.4	0.4	9.9	4.4	
3	0.4	4.3	10.0	18.3	11.7	13.5	9.6	6.5	7.4	7.0	3.5	5.2	1.7	0.0	0.4	0.4	9.9	4.4	
4	0.9	5.7	13.0	15.7	15.7	9.6	10.0	5.2	5.2	5.7	3.9	6.1	2.6	0.0	0.4	0.4	9.7	4.3	
5	1.7	4.8	13.9	10.9	14.3	11.3	8.7	8.3	6.5	3.9	4.3	6.1	2.6	1.3	0.9	0.4	10.3	4.6	
6	0.4	6.1	14.5	8.8	12.3	11.0	12.3	9.6	5.7	5.7	3.5	5.3	2.2	1.3	0.0	1.3	10.5	4.7	
7	1.8	8.0	9.8	11.1	18.2	11.6	8.0	7.6	6.7	3.6	3.6	7.6	0.9	0.4	0.9	0.4	9.8	4.4	
8	0.0	7.9	13.1	12.2	10.0	12.7	8.3	10.0	7.0	4.8	2.6	7.4	2.2	0.9	0.4	0.4	10.1	4.5	
H	9.0	7.4	13.9	10.4	10.9	13.9	10.9	4.3	6.5	6.5	2.2	10.0	1.3	0.9	0.9	0.0	10.3	4.6	
O	10.0	4.4	7.9	11.0	14.5	11.0	11.9	9.3	8.4	4.0	5.7	7.5	2.6	0.4	0.4	0.9	11.3	5.1	
U	11.0	0.0	1.8	5.7	10.1	11.4	11.0	12.3	10.1	11.0	7.5	7.0	7.5	3.1	1.3	0.0	0.4	12.2	5.5
R	12.0	0.0	0.0	6.1	9.2	11.8	11.0	8.8	13.2	9.6	9.6	3.5	13.2	2.6	0.4	0.9	0.0	12.8	5.7
13	0.0	0.4	7.5	7.1	11.1	11.5	12.4	8.4	10.2	8.0	6.6	12.4	1.8	1.3	0.9	0.4	13.1	5.8	
14	0.0	0.4	6.3	10.3	8.0	10.7	9.4	12.1	8.9	7.1	5.8	13.8	4.9	0.4	0.9	0.9	13.7	6.1	
15	0.0	1.3	3.9	10.1	12.7	10.1	9.6	9.2	5.7	7.9	8.8	14.9	3.1	1.8	0.9	0.0	13.5	6.0	
16	0.0	1.3	5.6	9.1	13.8	10.3	7.8	5.6	8.2	6.0	9.9	16.4	3.4	1.7	0.4	0.4	13.6	6.1	
17	0.4	2.6	5.6	9.1	11.6	9.5	8.6	7.3	6.5	12.1	7.3	10.8	6.0	1.7	0.0	0.9	13.3	6.0	
18	0.4	1.7	7.4	10.0	10.4	9.1	13.4	7.4	6.1	7.8	6.5	11.3	5.6	2.6	0.0	0.4	13.1	5.9	
19	0.4	0.9	9.0	13.3	11.2	7.7	11.2	7.7	9.0	8.2	4.3	12.9	3.0	0.4	0.0	0.9	12.2	5.5	
20	0.9	2.1	9.4	14.2	9.0	9.0	11.2	7.7	9.4	5.6	5.2	9.0	4.3	2.1	0.9	0.0	12.0	5.4	
21	0.4	4.3	11.6	15.5	9.9	6.0	7.3	9.9	9.4	6.9	5.6	8.6	1.3	2.6	0.9	0.0	11.3	5.1	
22	0.9	4.3	14.5	11.1	13.2	8.1	10.3	9.0	7.7	4.3	2.1	9.4	1.7	1.7	1.3	0.4	10.8	4.8	
23	0.9	3.8	13.7	16.2	10.7	10.7	9.4	9.0	6.8	5.6	3.8	4.3	3.0	0.9	0.4	0.9	10.3	4.6	
24	0.9	2.6	15.8	13.2	12.4	11.5	9.8	9.0	7.3	3.8	2.1	6.8	2.6	1.7	0.4	0.0	10.2	4.6	
ALL HOURS	0.5	3.7	10.2	11.9	12.0	10.5	9.9	8.6	7.4	6.3	4.6	9.1	2.8	1.2	0.6	0.5	11.4	5.1	

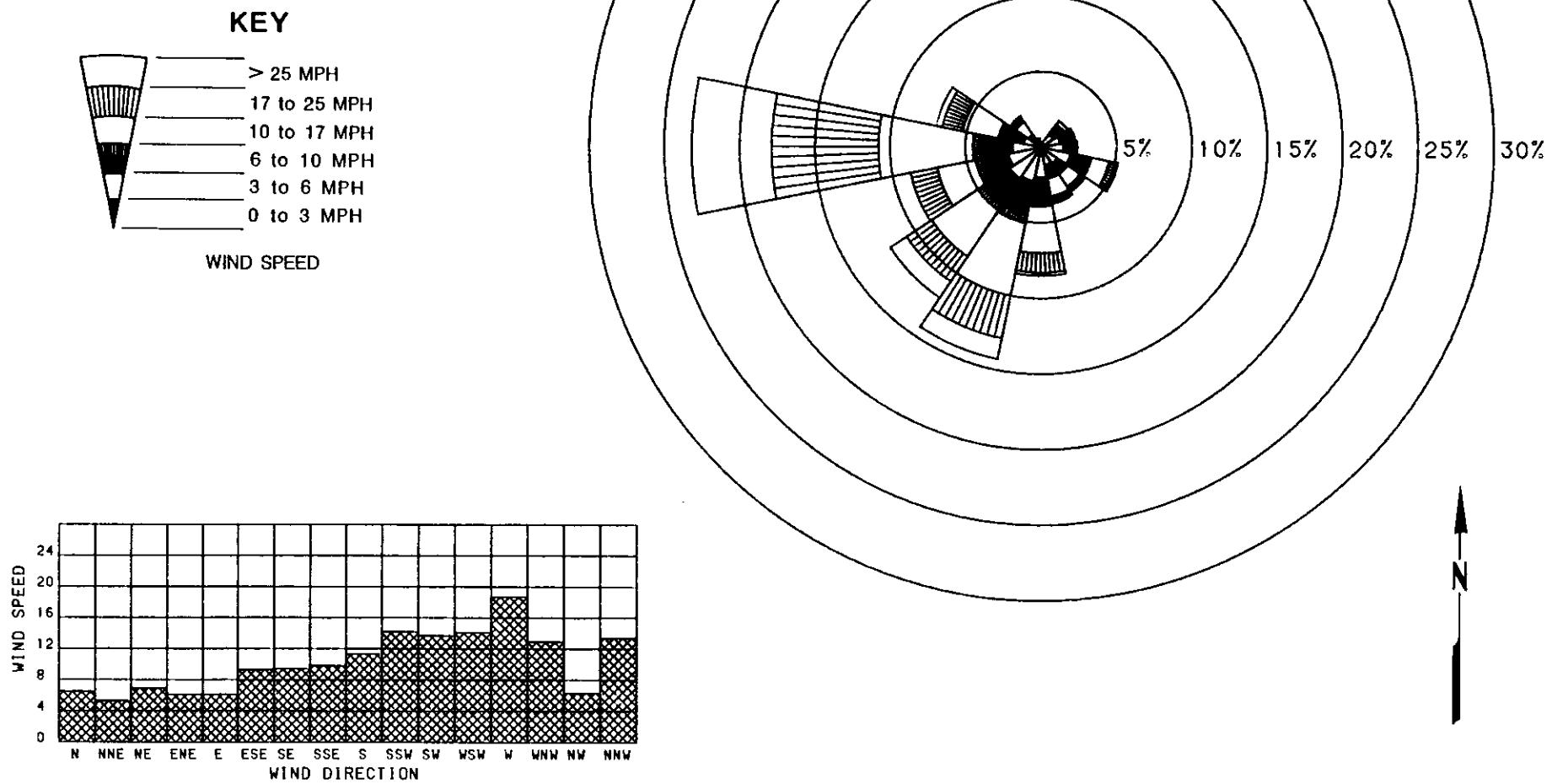
SOURCE: GEORESEARCH, INC.

**Table IV - 48**  
**Annual Wind Rose Distribution**  
**DEER LODGE COUNTY - ANACONDA C-HILL**  
**01/01/76 - 05/31/79**

DIRECTION>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	<DIRECTION	SPEED (M/SEC)
	SPEED (MPH)																		
	0.1- 1.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	1.5	0.1- 0.4	
	1.1- 2.0	0.0	0.0	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.0	0.1	2.7	0.5- 0.9	
	2.1- 3.0	0.0	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.4	0.3	0.3	0.3	0.2	0.1	0.1	3.7	1.0- 1.3 S	
	3.1- 4.0	0.0	0.1	0.2	0.2	0.3	0.5	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.2	0.1	0.1	4.3	1.4- 1.8 P
S	4.1- 5.0	0.0	0.1	0.2	0.3	0.3	0.4	0.2	0.2	0.5	0.5	0.6	0.5	0.4	0.3	0.2	0.1	4.8	1.9- 2.2 E
P	5.1- 6.0	0.0	0.0	0.2	0.3	0.3	0.4	0.3	0.2	0.4	0.6	0.6	0.7	0.5	0.3	0.1	0.1	5.3	2.3- 2.7 E
E	6.1- 7.0	0.0	0.0	0.3	0.3	0.3	0.4	0.2	0.3	0.5	0.6	0.6	0.6	0.6	0.4	0.1	0.0	5.3	2.8- 3.1 D
E	7.1- 8.0	0.0	0.0	0.2	0.3	0.2	0.4	0.2	0.2	0.4	0.6	0.7	0.6	0.6	0.4	0.1	0.0	5.1	3.2- 3.6
D	8.1- 9.0	0.0	0.0	0.2	0.2	0.1	0.3	0.2	0.2	0.5	0.7	0.6	0.5	0.7	0.5	0.2	0.1	5.2	3.7- 4.0 M
	9.1-10.0	0.0	0.0	0.1	0.1	0.1	0.3	0.2	0.2	0.5	0.9	0.6	0.5	0.7	0.4	0.1	0.0	4.9	4.1- 4.5 E
M	10.1-11.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.9	0.7	0.5	0.9	0.4	0.2	0.0	4.9	4.6- 4.9 T
I	11.1-12.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.2	0.5	0.7	0.6	0.4	0.9	0.4	0.2	0.0	4.6	5.0- 5.4 E
L	12.1-13.0	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.2	0.5	0.8	0.6	0.4	0.9	0.4	0.2	0.0	4.4	5.5- 5.8 R
E	13.1-14.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.4	0.7	0.5	0.3	0.9	0.3	0.1	0.0	4.0	5.9- 6.3 S
S	14.1-15.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.5	0.7	0.5	0.4	0.8	0.3	0.1	0.0	3.7	6.4- 6.7 /
/	15.1-16.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.4	0.5	0.4	0.3	1.0	0.3	0.1	0.0	3.4	6.8- 7.2 S
H	16.1-17.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.6	0.4	0.3	0.9	0.3	0.1	0.0	3.2	7.3- 7.6 E
O	17.1-18.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.5	0.4	0.3	0.9	0.3	0.1	0.0	3.0	7.7- 8.0 C
U	18.1-19.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.5	0.3	0.3	1.1	0.2	0.0	0.0	2.9	8.1- 8.5 O
R	19.1-20.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.4	0.3	0.2	0.9	0.2	0.1	0.0	2.5	8.6- 8.9 N
	20.1-25.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.6	1.5	1.0	1.0	4.2	0.7	0.2	0.0	9.7	9.0-11.2 D
	25.1-30.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.8	0.6	0.5	2.6	0.3	0.1	0.0	5.2	11.3-13.4
	30.1-35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.3	1.3	0.1	0.0	0.0	2.6	13.5-15.6
	35.1-40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7	0.0	0.0	0.0	1.1	15.7-17.9	
	>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.7	0.0	0.0	0.0	1.4	>17.9
	CALM																0.4	CALM	
AV SPD (MPH)	0.4	0.4	2.2	2.6	2.7	5.4	3.6	3.8	8.8	14.3	11.9	9.9	23.1	7.2	2.5	0.7	100.0	TOTAL	
AV SPD (M/S)	5.6	5.3	6.9	6.1	6.1	9.3	9.4	9.8	11.3	14.2	13.7	14.1	18.7	12.9	12.6	6.3	13.4	AV SPD (MPH)	
AV SPD (M/S)	2.5	2.4	3.1	2.7	2.7	4.2	4.2	4.4	5.1	6.4	6.1	6.3	8.4	5.7	5.6	2.8	6.0	AV SPD (M/S)	

SOURCE: GEORESEARCH, INC.

**Figure IV - 5**  
**Annual Wind Rose**  
**ANACONDA C-HILL — DEER LODGE COUNTY**  
**(1976 - 1979)**



**Table IV - 49**  
**Coefficients of Weibull Distribution**  
**DEER LODGE COUNTY - ANACONDA C-HILL**

**01/01/76 - 05/31/79**

MONTH	SCALE FACTOR (C) (M/SEC)	SHAPE FACTOR (K)
JANUARY	6.2265	1.5942
FEBRUARY	8.7423	1.4705
MARCH	7.8791	1.7362
APRIL	7.2504	1.5403
MAY	6.9668	1.8666
JUNE	6.1791	1.7193
JULY	4.6619	1.6962
AUGUST	5.2224	1.8563
SEPTEMBER	5.7329	1.6344
OCTOBER	5.6493	1.5167
NOVEMBER	5.7649	1.5737
DECEMBER	8.5135	1.6476
YEAR	6.5641	1.5997

SOURCE: GEORESEARCH, INC.

# **ANACONDA HIGHWAY JUNCTION**

## **DEER LODGE COUNTY**

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The Highway Junction site was located approximately 3 miles north of Anaconda at 46°08'09" N and 112°53'17" W (Site No. 29 on Map II-1). Elevation at the site was 5,100 feet. The site was established by the Montana Air Quality Bureau to measure concentrations of sulfur dioxide in the area.

Wind data were collected at the site from June 11, 1975, to December 28, 1979. Data through August 27, 1979, were analyzed for this *Atlas*. The data set contains hourly averages of wind speed and direction manually reduced from stripchart records. When monitoring at this site began, data were gathered by a Meteorology Research, Inc., mechanical recording unit. Beginning in 1978, data were collected by a Climatronics electronic anemometer and wind vane on a 10-meter tower.

Winds were monitored long enough at this site to adequately represent the wind resource. Wind data from this location are representative of a limited area near the site since it is located near the mouth of a large canyon to the west.

Data recovery ranged from 47.7 percent in December to 98.3 percent in March. Overall data recovery was 79.5 percent.

Average annual wind speed at the site was 8.0 miles per hour. Average monthly wind speeds ranged from 6.8 miles per hour in July to 9.3 miles per hour in November.

Average monthly wind power ranged from 26.9 watts/m<sup>2</sup> in July to 120.5 watts/m<sup>2</sup> in November. Average annual wind power was 62.8 watts/m<sup>2</sup>.

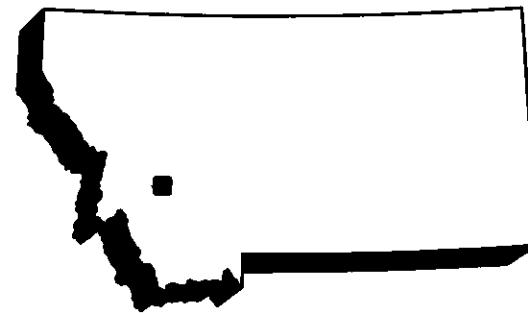


Table IV - 50

## Monthly Wind Speed Distribution

## DEER LODGE COUNTY - ANACONDA HIGHWAY JUNCTION

06/11/75 - 08/27/79

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
CALM	0.5	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.3	0.2	0.0	0.1	CALM
0.1-1.0	0.9	0.7	0.6	0.2	0.1	0.2	0.1	0.1	0.2	0.4	1.1	0.4	0.4	0.1- 0.4
1.1-2.0	9.9	4.4	3.3	3.4	2.2	2.2	3.1	2.4	3.1	4.8	6.3	6.0	4.0	0.5- 0.9
2.1-3.0	15.1	8.8	7.5	7.1	7.4	6.4	7.4	8.2	9.1	10.1	9.3	11.6	8.7	1.0- 1.3
3.1-4.0	12.1	9.2	9.6	9.3	7.8	7.7	9.5	8.6	9.1	9.0	8.9	9.3	9.1	1.4- 1.8
4.1-5.0	11.1	8.4	7.9	9.1	8.2	8.6	10.3	10.8	8.0	9.7	7.4	8.0	9.0	1.9- 2.2
5.1-6.0	5.9	6.7	8.1	9.2	7.7	8.3	10.8	9.4	9.7	8.9	6.0	6.7	8.3	2.3- 2.7
6.1-7.0	5.1	6.5	7.7	9.3	8.4	10.2	11.6	10.7	11.1	8.3	5.1	5.8	8.6	2.8- 3.1
7.1-8.0	3.7	5.9	6.9	8.4	7.9	10.0	10.4	10.9	9.6	7.3	5.2	4.4	7.9	3.2- 3.6
8.1-9.0	3.8	4.6	6.9	7.1	7.6	8.6	9.3	9.0	8.2	6.7	4.7	3.2	6.9	3.7- 4.0
9.1-10.0	3.4	3.7	4.6	5.7	6.7	8.0	8.5	8.3	7.7	5.7	3.9	3.3	6.0	4.1- 4.5
10.1-11.0	3.2	3.8	4.4	5.7	6.4	6.2	5.8	5.9	6.5	5.6	3.4	3.0	5.1	4.6- 4.9
11.1-12.0	3.0	4.0	4.8	4.6	6.0	3.8	4.3	4.2	5.1	4.3	4.4	3.3	4.4	5.0- 5.4
12.1-13.0	2.9	3.3	4.4	3.7	3.9	3.4	3.2	2.9	3.3	3.8	4.4	3.6	3.6	5.5- 5.8
13.1-14.0	1.8	4.0	3.9	3.8	4.4	2.7	1.8	2.0	2.1	3.5	3.3	3.9	3.1	5.9- 6.3
14.1-15.0	1.5	3.4	3.2	3.8	3.1	2.9	1.3	1.9	1.8	2.6	4.5	3.5	2.7	6.4- 6.7
15.1-16.0	1.9	3.9	3.3	2.2	2.9	2.7	0.9	1.0	1.5	2.5	4.1	4.3	2.5	6.8- 7.2
16.1-17.0	1.5	3.3	3.3	2.3	2.4	1.8	0.5	1.0	1.5	1.7	3.5	3.4	2.1	7.3- 7.6
17.1-18.0	1.3	3.5	2.4	1.6	2.1	2.0	0.5	1.0	1.0	1.3	2.9	2.8	1.8	7.7- 8.0
18.1-19.0	1.9	2.1	1.8	1.2	1.3	1.4	0.3	0.8	0.7	1.1	1.7	2.1	1.3	8.1- 8.5
19.1-20.0	1.6	1.9	1.6	1.0	1.4	0.7	0.3	0.4	0.2	0.9	1.6	2.3	1.1	8.6- 8.9
20.1-25.0	4.3	6.5	3.1	1.2	1.8	1.9	0.3	0.6	0.4	1.4	4.4	7.0	2.5	9.0-11.2
25.1-30.0	2.7	1.0	0.4	0.0	0.0	0.2	0.1	0.0	0.0	0.0	2.9	2.0	0.6	11.3-13.4
30.1-35.0	0.8	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2	0.1	13.5-15.6
35.1-40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	15.7-17.9
>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	>17.9
AVERAGE SPEED (MPH)	7.7	9.3	8.6	7.9	8.4	8.1	6.8	7.1	7.2	7.5	9.5	9.4	8.0	
AVERAGE SPEED (M/SEC)	3.4	4.2	3.8	3.5	3.8	3.6	3.0	3.2	3.2	3.3	4.2	4.2	3.6	
AVERAGE WIND POWER (WATTS/M**2)	102.8	103.8	72.4	51.6	57.0	52.1	26.9	32.5	34.7	46.6	120.5	117.2	62.8	
PERCENT DATA RECOVERY	69.4	91.7	98.3	95.1	86.8	76.0	93.9	78.2	74.1	70.8	69.8	47.7	79.5	

ANEMOMETER HEIGHT = 10 METERS = 33 FEET

NUMBER OF OBSERVATIONS = 29354

PERCENTAGE DATA RECOVERY = 79.5

SOURCE: GEORESEARCH, INC.

# ANACONDA MILL CREEK

## DEER LODGE COUNTY

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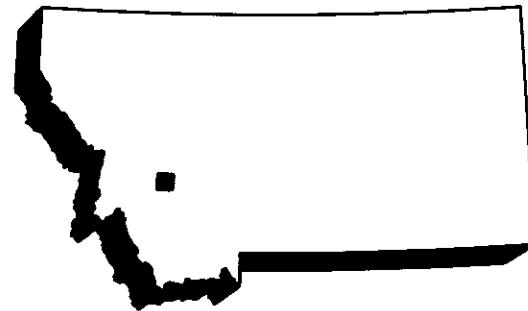
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The Mill Creek site was located approximately 4 miles east-southeast of Anaconda at 46°06'19" N and 112°52'45" W (Site No. 31 on Map II-1). Elevation at the site was 5,199 feet. The site was established by the Anaconda Copper Company to measure concentrations of particulates and sulfur dioxide in the area.

Wind data from December 4, 1976, through May 31, 1979, were collected at the site. Data through February 28, 1979, were analyzed for this *Atlas*. The data set consists of hourly averages of wind speed and wind direction manually reduced from stripchart records. Data recovery was fair to excellent, ranging from 41.1 percent in November to 97.5 percent in October. Overall data recovery was 70.0 percent. Winds were monitored long enough at this site to adequately represent the wind resource. The anemometer height was 10 meters. Because the site is located in complex terrain, the data are representative only of a limited area. DNRC-sponsored monitoring underway in 1986 and 1987 suggests wind speeds are greater closer to the mouth of the Mill Creek Valley.

Average annual wind speed at this site was 9.5 miles per hour. Average monthly wind speeds ranged from 7.4 miles per hour in July to 13.0 miles per hour in December.

Average monthly wind power ranged from 33.1 watts/m<sup>2</sup> in July to 211.5 watts/m<sup>2</sup> in December. Average annual wind power was 95.2 watts/m<sup>2</sup>.



**Table IV - 51**  
**Monthly Wind Speed Distribution**  
**DEER LODGE COUNTY - ANACONDA MILL CREEK**

12/04/76 - 02/28/79

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
CALM	4.1	2.6	3.7	0.5	0.2	0.4	0.5	0.7	0.1	0.1	3.7	0.4	1.3	CALM
0.1-1.0	4.7	6.0	4.0	3.5	2.9	3.0	1.8	1.8	1.8	1.9	6.9	2.6	3.3	0.1- 0.4
1.1-2.0	5.8	5.2	3.3	3.7	4.3	3.3	4.2	3.8	3.8	3.5	8.1	3.5	4.3	0.5- 0.9
2.1-3.0	6.1	5.8	3.9	6.2	5.2	5.1	4.4	6.0	4.1	3.7	7.4	3.6	5.0	1.0- 1.3
3.1-4.0	5.7	6.0	4.3	5.2	7.0	6.4	6.5	5.3	5.3	4.4	6.9	3.2	5.3	1.4- 1.8
4.1-5.0	6.7	6.3	4.7	6.7	6.7	8.5	9.5	5.3	7.5	7.0	4.9	3.1	6.2	1.9- 2.2
5.1-6.0	5.4	6.5	5.6	8.0	7.3	8.4	12.1	10.0	7.6	7.7	4.4	3.6	6.8	2.3- 2.7
6.1-7.0	5.9	8.1	6.1	6.3	8.4	12.4	10.2	10.2	8.9	8.4	5.2	3.8	7.3	2.8- 3.1
7.1-8.0	5.8	4.6	6.6	10.2	8.1	10.4	10.7	12.7	10.2	8.3	2.9	4.6	7.7	3.2- 3.6
8.1-9.0	5.3	5.1	7.0	7.7	7.0	8.0	10.8	8.9	9.1	7.2	3.7	3.6	6.6	3.7- 4.0
9.1-10.0	4.5	2.9	3.3	7.5	6.7	9.0	8.4	8.8	9.1	6.1	3.7	4.3	6.1	4.1- 4.5
10.1-11.0	2.9	3.4	5.4	6.9	7.7	5.1	6.0	5.3	5.8	5.0	1.7	4.2	5.0	4.6- 4.9
11.1-12.0	3.3	5.2	4.7	5.2	5.8	4.8	4.0	4.2	5.6	4.3	3.5	3.7	4.5	5.0- 5.4
12.1-13.0	2.0	3.3	4.4	4.5	4.2	3.8	2.1	2.3	3.6	5.9	3.4	4.9	3.9	5.5- 5.8
13.1-14.0	2.8	4.9	5.1	4.0	3.9	2.6	3.2	2.5	3.9	3.8	2.7	4.4	3.7	5.9- 6.3
14.1-15.0	3.1	3.6	4.3	3.8	3.9	3.0	1.3	1.8	2.7	4.2	3.0	5.1	3.6	6.4- 6.7
15.1-16.0	2.9	3.4	3.7	3.3	3.3	1.8	1.3	1.5	2.8	4.7	3.5	5.1	3.4	6.8- 7.2
16.1-17.0	3.9	3.8	3.3	1.4	2.6	1.1	1.3	3.5	2.1	2.7	3.7	4.8	3.0	7.3- 7.6
17.1-18.0	4.0	2.2	4.3	1.7	1.9	1.0	0.2	1.9	1.8	1.9	2.9	3.9	2.5	7.7- 8.0
18.1-19.0	2.7	2.8	1.9	1.3	1.1	0.3	0.8	1.8	1.4	2.1	4.2	3.6	2.1	8.1- 8.5
19.1-20.0	2.6	2.1	2.5	1.0	0.7	0.7	0.3	1.0	1.2	2.3	3.0	4.0	2.0	8.6- 8.9
20.1-25.0	8.2	4.9	6.6	1.1	0.9	0.9	0.3	0.7	1.6	4.3	8.6	14.7	5.2	9.0-11.2
25.1-30.0	1.5	1.2	1.4	0.1	0.1	0.0	0.0	0.0	0.1	0.5	1.5	4.1	1.1	11.3-13.4
30.1-35.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	0.1	13.5-15.6
35.1-40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	15.7-17.9
>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	>17.9
AVERAGE SPEED (MPH)	9.5	9.1	10.1	8.4	8.4	7.7	7.4	8.1	8.6	9.6	9.4	13.0	9.5	
AVERAGE SPEED (M/SEC)	4.2	4.1	4.5	3.7	3.8	3.4	3.3	3.6	3.8	4.3	4.2	5.8	4.2	
AVERAGE WIND POWER (WATTS/M**2)	120.8	99.0	114.0	57.1	55.7	40.7	33.1	48.2	57.4	85.0	123.4	211.5	95.2	
PERCENT DATA RECOVERY	85.7	44.1	48.8	97.9	89.9	48.8	41.5	45.9	97.3	97.5	41.1	93.0	70.0	

ANEMOMETER HEIGHT = 10 METERS = 33 FEET  
NUMBER OF OBSERVATIONS = 13730  
PERCENTAGE DATA RECOVERY = 70.0

SOURCE: GEORESEARCH, INC.

# ANACONDA WEATHER HILL

## DEER LODGE COUNTY

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The Weather Hill air monitoring site was located approximately 2 miles southeast of Anaconda at 46°05'51"N and 112°54'51"W (Site No. 33 on Map II-1). Elevation at the site was 6,378 feet. The site is owned by Anaconda Copper Company. The air monitoring station was established by the company to monitor concentrations of particulates and sulfur dioxide.

The land around the site is very rugged. To the southwest, the Anaconda Range rises to more than 11,000 feet. To the north is the Flint Creek Range, with summits over 10,000 feet. The area is dissected by many deep canyons.

In general, land in the valleys is privately owned, while land in the mountains is controlled by the U.S. Forest Service. Several major electrical transmission lines cross the Deer Lodge Valley. The nearest commercial airport is the Anaconda airport, located northeast of the site.

Wind data for December 4, 1976, through May 31, 1979, were available for analysis. The data set consists of hourly averages of wind speed and wind direction manually reduced from stripchart records. Anemometer height was 10 meters.

Data recovery varied from 32.6 percent in March to 97.3 percent in September. Overall data recovery was 63.6 percent. Winds were monitored long enough to adequately represent the wind resource at this location. Because of the region's complex terrain, however, the data are representative only of the area near the site, which is on a narrow ridge crest. The rugged nature of the site limits the possibilities for development.

Average annual wind speed at this site was 17.0 miles per hour. Average monthly wind speed ranged from 11.7 miles per hour in July to 23.9 miles per hour in December.

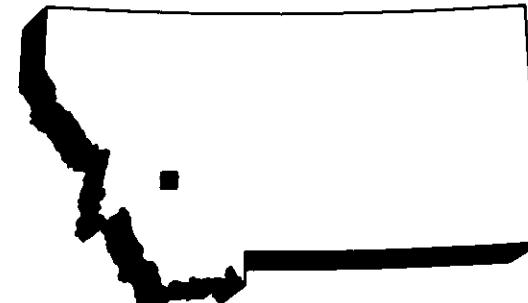
Average annual wind power was 517.4 watts/m<sup>2</sup>. Average monthly wind power ranged from 197.1 watts/m<sup>2</sup> in July to 1,147.7 watts/m<sup>2</sup> in December.

Average seasonal wind speeds were 13.1 miles per hour in summer, 16.0 miles per hour in autumn, 16.7 miles per hour in spring, and 19.8 miles per hour in winter. Average wind speeds were highest around noon during the winter. During the other seasons the highest average wind speeds occurred from mid to late afternoon. The lowest average wind speeds occurred in the early evening in autumn and winter, around midnight in spring, and after dawn during the summer.

The diurnal range of average hourly wind speeds was greatest in the summer and least in the winter. Most of the variation in average wind speeds among the seasons was due to differences in the average nighttime wind speed.

The most common wind direction was west-southwest. Winds blew from this direction 40 percent of the time. Winds from the west and west-northwest blew 21.6 percent of the time. The least common wind directions were north-northwest through north-northeast.

Average wind speeds by direction ranged from 5.9 miles per hour from the east to 21.9 miles per hour from the west-southwest. The strongest winds were those from the prevailing wind directions.



**Table IV - 52**  
**Monthly Wind Speed Distribution**  
**DEER LODGE COUNTY - ANACONDA WEATHER HILL**  
**12/04/76 - 05/31/79**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
CALM	0.1	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.3	0.3	0.8	0.0	0.1	CALM
0.1-1.0	1.8	2.0	1.4	1.2	0.9	2.0	1.5	2.2	1.9	1.2	2.9	0.8	1.5	0.1- 0.4
1.1-2.0	2.7	3.6	2.6	2.2	1.2	1.8	3.4	4.7	2.1	3.1	4.1	1.6	2.4	0.5- 0.9
2.1-3.0	3.3	4.5	2.9	2.6	1.6	3.0	6.3	3.1	1.7	3.6	4.5	1.5	2.8	1.0- 1.3
3.1-4.0	4.5	3.3	3.3	3.2	2.5	2.0	5.8	4.6	3.1	3.0	7.0	1.5	3.3	1.4- 1.8
4.1-5.0	3.6	3.1	2.5	3.3	3.4	3.0	7.3	4.7	2.8	2.8	4.5	2.4	3.4	1.9- 2.2
5.1-6.0	3.7	2.7	3.0	3.9	3.0	5.3	7.0	4.1	3.1	4.9	5.2	1.3	3.5	2.3- 2.7
6.1-7.0	3.3	3.4	3.6	3.8	3.5	7.0	6.0	6.0	3.1	3.3	6.8	2.0	3.8	2.8- 3.1
7.1-8.0	3.2	3.7	3.6	4.4	3.4	5.7	5.2	4.9	2.9	3.5	4.7	1.7	3.5	3.2- 3.6
8.1-9.0	2.6	2.6	2.6	3.3	3.5	3.6	4.2	4.0	4.4	3.4	2.1	1.8	3.1	3.7- 4.0
9.1-10.0	2.8	2.7	2.1	3.5	3.6	4.4	4.4	4.0	3.6	3.5	3.3	2.0	3.2	4.1- 4.5
10.1-11.0	3.3	3.1	3.4	4.3	3.5	4.4	4.4	4.7	4.3	2.7	2.3	1.4	3.4	4.6- 4.9
11.1-12.0	2.8	3.6	2.1	4.4	2.5	4.4	4.5	4.0	4.0	3.2	1.4	1.3	3.1	5.0- 5.4
12.1-13.0	3.1	3.9	1.0	4.0	3.3	4.1	3.8	2.1	4.2	4.2	1.7	1.8	3.1	5.5- 5.8
13.1-14.0	2.8	3.4	2.9	4.6	4.2	5.3	3.8	4.6	4.4	4.4	1.7	1.7	3.6	5.9- 6.3
14.1-15.0	2.3	3.8	2.9	3.2	4.0	4.5	2.3	3.8	4.3	3.0	2.7	1.8	3.2	6.4- 6.7
15.1-16.0	2.2	2.0	2.8	4.1	4.6	4.0	2.6	2.9	5.1	2.8	1.9	3.2	3.4	6.8- 7.2
16.1-17.0	3.0	2.7	2.9	3.4	4.1	4.7	1.6	4.4	3.3	2.2	1.7	2.3	3.1	7.3- 7.6
17.1-18.0	3.0	2.6	2.8	3.5	3.5	4.0	3.1	3.4	4.1	3.6	1.4	2.7	3.2	7.7- 8.0
18.1-19.0	3.1	2.7	3.4	3.0	4.0	4.1	1.7	2.1	2.2	3.6	1.2	3.3	3.0	8.1- 8.5
19.1-20.0	3.2	3.4	4.5	4.0	3.1	2.0	3.6	3.1	3.4	3.5	2.1	2.5	3.2	8.6- 8.9
20.1-25.0	15.8	10.6	15.3	13.0	16.7	8.8	9.3	10.5	14.2	13.6	9.3	14.6	13.6	9.0-11.2
25.1-30.0	12.2	9.4	12.9	8.9	12.0	4.8	5.2	7.1	10.4	12.9	10.1	14.4	10.8	11.3-13.4
30.1-35.0	5.9	8.0	6.3	4.5	5.5	4.7	2.0	3.8	5.6	4.7	7.6	12.7	6.3	13.5-15.6
35.1-40.0	3.3	5.7	5.4	2.3	2.0	1.6	0.4	0.7	1.1	2.6	6.2	10.0	3.7	15.7-17.9
>40.0	2.4	3.4	3.7	1.4	0.4	1.0	0.4	0.6	0.6	0.7	2.9	9.8	2.6	>17.9
AVERAGE SPEED (MPH)	17.0	17.4	18.5	15.7	16.8	14.1	11.7	13.4	16.0	16.0	15.8	23.9	17.0	
AVERAGE SPEED (M/SEC)	7.6	7.8	8.3	7.0	7.5	6.3	5.2	6.0	7.1	7.2	7.1	10.7	7.6	
AVERAGE WIND POWER (WATTS/M**2)	542.2	610.1	635.4	396.5	403.6	301.9	197.1	260.7	383.1	404.9	564.2	1147.7	517.4	
PERCENT DATA RECOVERY	86.1	44.1	32.6	65.3	93.4	48.9	46.1	45.6	97.3	67.5	35.8	86.0	63.6	

ANEMOMETER HEIGHT = 10 METERS = 33 FEET

NUMBER OF OBSERVATIONS = 13882

PERCENTAGE DATA RECOVERY = 63.6

SOURCE: GEORESEARCH, INC.

Table IV - 53

## Percentage Frequency Summary for Wind Speed

## DEER LODGE COUNTY - ANACONDA WEATHER HILL (WINTER)

12/04/76 - 05/31/79

	CALM	WIND SPEED (MPH)															AV (MPH)	AV (M/SEC)	
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0	>40.0			
		0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9			
	1	0.0	5.2	5.2	7.3	3.6	2.1	4.2	6.3	5.2	7.3	4.7	18.2	14.1	8.3	5.2	3.1	19.4	8.7
	2	0.0	6.2	5.7	3.6	3.6	4.7	7.3	4.1	4.7	3.1	5.2	17.1	15.5	8.3	4.7	6.2	20.1	9.0
	3	0.0	5.2	5.7	5.2	3.1	3.6	5.7	3.6	7.8	4.7	5.2	19.2	10.4	9.3	5.2	6.2	19.9	8.9
	4	0.0	4.1	5.2	5.7	2.6	3.6	6.7	5.2	4.7	5.7	5.7	16.6	15.5	7.3	6.2	5.2	20.2	9.0
	5	0.0	4.6	6.2	1.0	5.6	5.6	3.1	6.2	6.7	7.7	9.2	9.7	13.8	9.2	7.2	4.1	20.0	8.9
	6	0.0	4.1	5.6	4.1	5.6	3.1	3.1	7.7	5.1	8.2	4.1	16.4	13.3	6.7	7.2	5.6	20.1	9.0
	7	0.0	3.1	5.2	5.2	6.2	6.2	1.5	4.6	5.7	5.7	6.7	17.5	12.9	7.2	5.7	6.7	20.2	9.0
	8	0.0	3.6	2.6	4.7	6.3	3.1	6.3	5.7	4.7	4.7	6.8	15.1	13.0	10.9	5.7	6.8	20.8	9.3
H	9	0.0	2.1	4.7	3.2	7.4	3.7	6.3	7.4	6.8	4.2	6.8	11.1	14.2	7.9	6.8	7.4	20.6	9.2
O	10	0.0	0.5	8.4	5.2	4.2	4.7	3.7	6.8	4.7	6.8	4.7	14.7	14.1	5.2	8.9	7.3	20.7	9.3
O	11	0.0	2.6	4.2	4.7	5.2	7.9	3.7	2.6	2.6	5.8	7.9	12.6	13.1	14.7	4.2	8.4	21.6	9.6
U	12	0.0	2.6	5.7	7.7	5.2	2.6	2.1	4.1	4.1	2.1	5.7	16.0	12.4	9.8	12.9	7.2	22.3	10.0
U	13	0.0	1.0	3.7	6.8	6.8	3.7	3.1	5.8	6.3	3.1	4.2	12.0	12.6	15.2	7.9	7.9	22.1	9.9
R	14	0.0	1.6	3.6	7.8	6.8	4.2	6.3	3.1	1.0	4.7	4.2	16.1	15.1	9.4	10.9	5.2	21.4	9.6
R	15	0.0	4.1	5.7	6.7	6.7	3.1	4.6	4.1	5.2	2.1	5.2	14.9	12.4	12.9	8.8	3.6	20.2	9.0
	16	0.0	3.6	8.6	6.1	5.6	4.1	5.1	5.1	6.6	6.6	2.0	12.7	13.7	9.1	7.1	4.1	19.1	8.5
	17	0.0	5.6	6.6	8.6	4.5	8.6	3.5	4.0	3.5	5.6	4.5	16.7	12.1	7.1	4.0	5.1	18.1	8.1
	18	0.5	3.6	10.7	7.6	5.1	4.6	5.1	4.1	3.0	9.6	6.6	12.7	10.2	9.6	3.6	3.6	17.6	7.9
	19	0.5	5.1	9.1	6.6	8.1	5.6	4.1	6.1	3.0	6.1	7.1	10.7	11.2	6.1	5.6	5.1	17.6	7.9
	20	0.0	8.2	6.1	7.7	5.6	6.6	7.7	4.6	5.1	4.6	4.6	10.2	9.2	9.2	5.6	5.1	17.5	7.8
	21	0.0	3.0	7.6	6.6	4.6	5.1	8.6	8.1	3.0	6.6	6.6	12.2	10.2	9.1	4.1	4.6	18.3	8.2
	22	0.0	5.0	6.0	2.5	5.5	7.5	6.5	5.5	4.5	6.5	8.0	14.6	10.1	6.0	6.5	5.0	19.0	8.5
	23	0.0	4.0	4.5	4.0	8.5	4.0	5.5	5.5	6.0	5.5	9.5	12.0	12.5	7.0	5.5	6.0	19.4	8.7
	24	0.0	4.1	5.1	5.6	5.1	6.6	3.6	3.6	8.1	4.6	9.6	15.2	9.6	10.2	5.1	4.1	19.0	8.5
	ALL HOURS	0.0	3.9	5.9	5.6	5.5	4.8	4.9	5.2	4.9	5.5	6.0	14.3	12.5	9.0	6.4	5.5	19.8	8.8

SOURCE: GEORESEARCH, INC.

Table IV - 54  
 Percentage Frequency Summary for Wind Speed  
**DEER LODGE COUNTY - ANACONDA WEATHER HILL (SPRING)**  
**12/04/76 - 05/31/79**

	CALM	WIND SPEED (MPH)															AV SPEED (MPH)	AV SPEED (M/SEC)	
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0	>40.0			
		0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9			
1	0.6	4.1	5.2	11.6	9.9	11.0	7.0	8.7	5.2	7.0	4.7	15.1	5.2	2.9	0.6	1.2	13.8	6.2	
2	0.6	4.7	9.9	11.1	9.4	5.8	6.4	2.9	7.0	10.5	4.7	15.8	5.3	3.5	1.8	0.6	13.9	6.2	
3	0.0	5.3	7.6	11.1	5.3	7.6	3.5	8.2	9.4	7.0	8.2	10.5	10.5	3.5	1.2	1.2	14.8	6.6	
4	0.6	4.6	8.0	8.0	6.9	8.0	7.5	4.6	9.2	4.0	11.5	12.1	7.5	4.6	1.7	1.1	14.9	6.7	
5	0.0	4.0	8.6	8.0	5.1	3.4	4.0	9.7	9.7	7.4	10.9	13.1	8.6	5.7	0.6	1.1	15.7	7.0	
6	0.6	6.9	8.0	4.0	6.9	4.6	9.7	5.1	7.4	7.4	8.6	15.4	9.1	2.9	0.6	15.3	6.9		
7	0.0	5.8	9.2	8.7	6.9	4.6	6.4	8.1	6.4	8.1	4.0	15.0	11.0	2.3	2.9	0.6	14.9	6.6	
8	0.6	8.7	9.3	6.4	9.9	5.2	3.5	2.9	8.7	4.7	6.4	18.6	8.7	4.7	0.0	1.7	14.7	6.6	
H	9	0.0	4.1	2.3	14.6	8.2	7.0	4.1	9.4	4.7	3.5	3.5	15.8	14.0	3.5	2.9	2.3	16.2	7.2
O	10	0.0	2.3	6.4	6.9	7.5	5.8	5.8	7.5	5.8	6.9	6.9	12.7	13.3	6.9	3.5	1.7	17.3	7.7
U	11	0.0	1.7	3.4	5.7	9.7	4.0	7.4	5.1	5.1	5.1	7.4	17.1	13.1	10.3	3.4	1.1	18.4	8.2
R	12	0.0	1.1	2.8	2.8	8.0	7.4	5.7	5.1	6.8	7.4	9.7	14.8	19.9	2.8	2.3	3.4	18.9	8.4
	13	0.0	0.0	2.8	3.4	7.3	7.3	7.9	5.6	5.1	6.2	6.2	19.2	16.4	6.2	4.5	1.7	19.3	8.6
	14	0.0	0.6	1.1	4.6	6.3	9.1	5.7	5.1	8.6	4.6	8.6	15.4	17.1	9.1	2.3	1.7	19.2	8.6
	15	0.0	0.6	1.7	2.8	5.0	5.0	7.8	6.7	5.6	5.0	8.9	22.3	16.2	6.7	4.5	1.1	19.9	8.9
	16	0.0	0.6	0.6	1.7	6.7	3.9	10.0	5.6	8.9	7.2	7.2	21.1	11.1	10.0	5.0	0.6	19.8	8.8
	17	0.0	0.0	1.7	2.8	3.9	10.0	4.4	3.9	8.3	10.6	7.8	16.1	15.6	10.6	2.2	2.2	19.9	8.9
	18	0.0	0.0	2.2	2.2	2.8	5.6	7.8	11.7	10.1	6.7	7.3	17.9	11.7	7.8	4.5	1.7	19.4	8.7
	19	0.0	0.0	0.6	4.5	5.0	6.7	11.2	5.6	8.4	10.6	7.3	15.6	12.8	5.6	4.5	1.7	18.9	8.5
	20	0.0	0.6	3.9	3.9	7.3	7.9	5.6	10.7	7.3	9.0	7.3	13.5	12.4	5.6	2.8	2.2	17.9	8.0
	21	0.0	1.1	5.6	7.8	7.8	5.6	8.9	14.0	7.8	7.3	3.9	15.6	7.8	2.2	3.4	1.1	15.7	7.0
	22	0.0	3.9	7.3	8.9	5.0	8.9	10.1	7.3	8.9	7.8	8.4	10.6	7.3	2.8	2.2	0.6	14.5	6.5
	23	0.0	3.9	7.8	6.7	13.9	7.8	5.0	9.4	8.9	7.8	5.0	13.3	5.6	2.8	2.2	0.0	13.8	6.2
	24	0.0	3.9	5.6	9.4	11.7	6.1	7.8	9.4	10.6	6.1	8.9	8.3	6.1	3.3	2.8	0.0	14.0	6.3
ALL HOURS		0.1	2.8	5.0	6.5	7.3	6.6	6.8	7.2	7.7	7.0	7.2	15.2	11.1	5.3	2.7	1.3	16.7	7.5

SOURCE: GEORESEARCH, INC.

**Table IV - 55**  
**Percentage Frequency Summary for Wind Speed**  
**DEER LODGE COUNTY - ANACONDA WEATHER HILL (SUMMER)**

12/04/76 - 05/31/79

	CALM	WIND SPEED (MPH)																AV SPEED (MPH)	AV SPEED (M/SEC)
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0	>40.0			
		WIND SPEED (M/SEC)	0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9		
1	0.0	6.9	17.2	16.1	11.5	8.0	5.7	8.0	4.6	5.7	3.4	8.0	1.1	2.3	0.0	1.1	10.4	4.6	
2	0.0	13.8	9.2	20.7	9.2	2.3	9.2	4.6	5.7	6.9	3.4	6.9	4.6	1.1	1.1	1.1	10.6	4.8	
3	0.0	12.6	19.5	10.3	10.3	3.4	3.4	8.0	8.0	4.6	5.7	8.0	1.1	3.4	1.1	0.0	10.6	4.7	
4	0.0	14.9	11.5	10.3	8.0	6.9	11.5	5.7	3.4	10.3	1.1	9.2	4.6	2.3	0.0	0.0	10.7	4.8	
5	0.0	11.8	12.9	9.4	9.4	3.5	3.5	14.1	7.1	8.2	4.7	8.2	5.9	1.2	0.0	0.0	11.2	5.0	
6	0.0	10.6	9.4	14.1	8.2	4.7	4.7	9.4	5.9	9.4	12.9	3.5	4.7	2.4	0.0	0.0	11.5	5.1	
7	0.0	11.6	12.8	11.6	11.6	9.3	3.5	4.7	8.1	9.3	7.0	5.8	3.5	1.2	0.0	0.0	10.4	4.6	
8	0.0	11.4	21.6	11.4	9.1	4.5	6.8	5.7	5.7	6.8	6.8	4.5	4.5	1.1	0.0	0.0	9.7	4.3	
H	9	0.0	8.0	14.8	14.8	13.6	6.8	4.5	5.7	9.1	9.1	2.3	6.8	2.3	0.0	0.0	10.2	4.5	
O	10	0.0	1.2	11.6	23.3	12.8	9.3	9.3	3.5	4.7	7.0	4.7	8.1	1.2	3.5	0.0	0.0	10.7	4.8
R	11	0.0	0.0	4.6	21.8	20.7	9.2	10.3	6.9	5.7	3.4	2.3	4.6	8.0	1.1	1.1	0.0	11.4	5.1
	12	0.0	0.0	1.1	11.2	20.2	12.4	14.6	10.1	5.6	2.2	2.2	10.1	3.4	5.6	1.1	0.0	13.0	5.8
	13	0.0	0.0	2.3	5.7	18.2	11.4	5.7	12.5	15.9	3.4	1.1	9.1	6.8	5.7	2.3	0.0	14.7	6.6
	14	0.0	0.0	1.2	1.2	5.9	17.6	12.9	5.9	12.9	11.8	3.5	5.9	11.8	7.1	2.4	0.0	16.6	7.4
	15	0.0	0.0	2.4	2.4	9.4	10.6	12.9	8.2	2.4	5.9	8.2	12.9	10.6	10.6	1.2	2.4	17.8	8.0
	16	0.0	0.0	0.0	6.0	9.6	10.8	13.3	7.2	8.4	3.6	6.0	16.9	9.6	4.8	1.2	2.4	16.8	7.5
	17	0.0	0.0	1.2	4.9	3.7	2.4	14.6	11.0	11.0	7.3	9.8	18.3	9.8	6.1	0.0	0.0	17.2	7.7
	18	0.0	1.2	2.4	3.5	8.2	3.5	10.6	15.3	5.9	4.7	7.1	25.9	4.7	5.9	1.2	0.0	16.8	7.5
	19	0.0	0.0	2.3	4.6	8.0	13.8	9.2	10.3	2.3	4.6	12.6	16.1	9.2	3.4	2.3	1.1	16.6	7.4
	20	0.0	1.2	2.4	4.7	12.9	8.2	12.9	3.5	7.1	10.6	7.1	12.9	7.1	7.1	1.2	1.2	16.1	7.2
	21	0.0	1.2	4.7	7.1	15.3	14.1	7.1	3.5	7.1	8.2	7.1	7.1	10.6	2.4	2.4	2.4	15.0	6.7
	22	0.0	3.4	8.0	12.6	8.0	4.6	14.9	12.6	6.9	10.3	1.1	5.7	6.9	2.3	1.1	1.1	12.9	5.8
	23	0.0	5.7	11.4	9.1	14.8	10.2	5.7	9.1	2.3	10.2	6.8	6.8	3.4	1.1	1.1	2.3	12.2	5.5
	24	0.0	8.0	11.5	12.6	18.4	8.0	4.6	3.4	6.9	5.7	6.9	8.0	2.3	1.1	1.1	1.1	11.0	4.9
	ALL HOURS	0.0	5.2	8.2	10.4	11.6	8.2	8.8	7.9	6.8	7.1	5.6	9.5	5.7	3.5	0.9	0.7	13.1	5.8

SOURCE: GEORESEARCH, INC.

**Table IV - 56**  
**Percentage Frequency Summary for Wind Speed**  
**DEER LODGE COUNTY - ANACONDA WEATHER HILL (AUTUMN)**  
**12/04/76 - 05/31/79**

	CALM	WIND SPEED (MPH)														AV SPEED (MPH)	AV SPEED (M/SEC)		
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0				
		0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9			
1	0.8	9.0	6.6	4.9	13.9	9.0	4.1	4.1	9.0	8.2	3.3	13.9	7.4	2.5	3.3	0.0	13.8	6.2	
2	1.6	6.6	6.6	7.4	9.8	4.9	7.4	7.4	8.2	6.6	5.7	10.7	10.7	1.6	4.1	0.8	14.8	6.6	
3	0.8	6.6	4.9	6.6	9.0	9.0	2.5	9.0	7.4	10.7	4.1	14.8	6.6	4.9	2.5	0.8	15.0	6.7	
4	0.0	4.2	8.3	9.2	3.3	6.7	5.8	5.8	8.3	8.3	9.2	14.2	10.8	3.3	1.7	0.8	15.6	7.0	
5	0.0	4.2	7.6	6.7	7.6	2.5	3.4	7.6	9.2	9.2	8.4	15.1	10.9	5.0	0.8	1.7	16.4	7.3	
6	1.7	2.5	5.9	7.6	4.2	5.9	5.0	7.6	8.4	6.7	8.4	16.8	10.9	3.4	3.4	1.7	16.7	7.5	
7	0.8	5.9	4.2	5.9	4.2	6.8	6.8	7.6	7.6	2.5	11.9	13.6	15.3	0.8	5.1	0.8	16.7	7.5	
8	0.8	7.4	4.1	4.9	3.3	5.7	6.6	8.2	4.1	5.7	8.2	18.9	9.8	5.7	5.7	0.8	17.4	7.8	
H	9	0.8	4.2	9.2	6.7	5.0	4.2	3.4	7.6	8.4	2.5	8.4	12.6	15.1	6.7	4.2	0.8	17.1	7.7
O	10	0.0	6.7	6.7	5.0	5.8	6.7	5.0	4.2	6.7	5.8	3.3	13.3	16.7	9.2	2.5	2.5	18.0	8.1
U	11	0.8	2.5	7.4	8.2	4.9	5.7	9.8	2.5	4.9	2.5	2.5	14.8	17.2	9.8	6.6	0.0	18.2	8.2
R	12	0.0	1.6	4.1	8.9	10.6	8.9	2.4	4.9	5.7	3.3	4.1	12.2	18.7	10.6	4.1	0.0	18.0	8.1
	13	0.0	0.0	5.0	4.1	9.1	10.7	5.8	5.0	3.3	8.3	2.5	18.2	9.9	12.4	4.1	1.7	18.6	8.3
	14	0.0	0.0	2.5	4.2	9.2	10.8	5.8	5.0	6.7	5.8	6.7	10.8	17.5	10.8	4.2	0.0	18.7	8.4
	15	0.0	0.8	4.1	4.9	5.7	4.9	9.0	7.4	11.5	2.5	4.1	17.2	16.4	8.2	2.5	0.8	18.3	8.2
	16	0.0	3.3	3.3	3.3	5.7	6.6	8.2	7.4	9.0	7.4	6.6	20.5	13.1	4.1	0.8	0.8	17.2	7.7
	17	0.0	2.5	3.3	5.7	8.2	5.7	5.7	13.9	5.7	7.4	10.7	9.0	13.1	5.7	2.5	0.8	16.9	7.5
	18	0.0	2.5	5.7	4.9	4.9	10.7	13.1	9.8	10.7	3.3	4.9	14.8	8.2	4.9	0.0	1.6	15.5	6.9
	19	0.0	3.3	5.7	6.5	8.9	14.6	13.0	11.4	5.7	5.7	3.3	10.6	8.1	1.6	0.0	1.6	13.7	6.1
	20	0.0	5.7	13.0	8.9	5.7	8.9	6.5	10.6	8.9	8.1	4.9	4.9	8.9	3.3	0.8	0.8	13.1	5.8
	21	0.8	7.3	10.5	10.5	8.1	6.5	9.7	6.5	6.5	7.3	6.5	6.5	6.5	5.6	0.0	1.6	13.2	5.9
	22	0.0	7.2	9.6	15.2	7.2	4.8	8.0	11.2	6.4	4.0	3.2	10.4	4.8	5.6	0.8	1.6	13.3	6.0
	23	0.0	8.0	10.4	11.2	12.0	5.6	7.2	4.8	5.6	7.2	2.4	11.2	7.2	4.0	1.6	1.6	13.4	6.0
	24	0.0	8.8	8.8	9.6	6.4	4.8	4.8	14.4	7.2	6.4	4.0	11.2	6.4	5.6	0.0	1.6	13.7	6.1
ALL HOURS		0.4	4.6	6.6	7.2	7.2	7.1	6.6	7.7	7.3	6.1	5.7	13.1	11.2	5.6	2.5	1.1	16.0	7.1

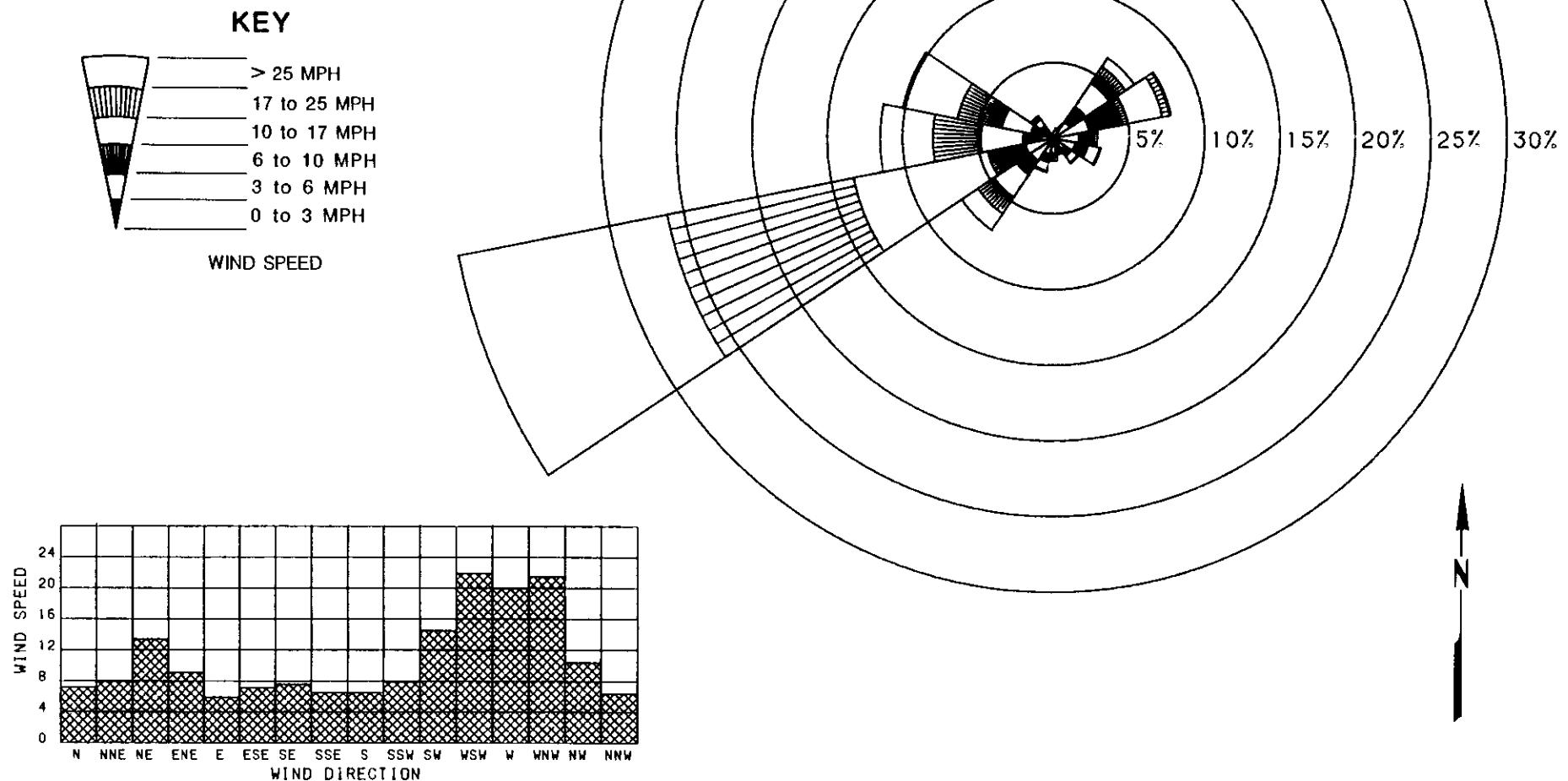
SOURCE: GEORESEARCH, INC.

Table IV - 57  
**Annual Wind Rose Distribution**  
**DEER LODGE COUNTY - ANACONDA WEATHER HILL**  
**12/04/76 - 05/31/79**

DIRECTION>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	<DIRECTION
	SPEED (MPH)																SPEED (M/SEC)	
0.1- 1.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	1.7	0.1- 0.4
1.1- 2.0	0.0	0.1	0.1	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.1	0.1	0.1	0.1	2.5	0.5- 0.9
2.1- 3.0	0.1	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	2.8	1.0- 1.3 S
3.1- 4.0	0.1	0.1	0.3	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.4	0.4	0.1	0.2	0.1	0.0	3.4	1.4- 1.8 P
S 4.1- 5.0	0.0	0.1	0.3	0.6	0.4	0.3	0.1	0.1	0.2	0.2	0.3	0.4	0.2	0.1	0.1	0.1	3.5	1.9- 2.2 E
P 5.1- 6.0	0.1	0.1	0.2	0.6	0.4	0.3	0.2	0.1	0.1	0.2	0.3	0.5	0.2	0.1	0.0	0.0	3.4	2.3- 2.7 E
E 6.1- 7.0	0.0	0.1	0.3	0.8	0.3	0.2	0.2	0.2	0.1	0.2	0.4	0.5	0.3	0.2	0.1	0.0	3.8	2.8- 3.1 D
E 7.1- 8.0	0.0	0.0	0.2	0.6	0.4	0.2	0.1	0.0	0.1	0.1	0.3	0.6	0.3	0.2	0.1	0.0	3.4	3.2- 3.6 M
D 8.1- 9.0	0.0	0.0	0.4	0.7	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.6	0.2	0.2	0.1	0.0	3.2	3.7- 4.0 /
M 9.1-10.0	0.0	0.1	0.3	0.5	0.1	0.2	0.1	0.1	0.0	0.1	0.2	0.8	0.4	0.2	0.1	0.1	3.2	4.1- 4.5 E
I 10.1-11.0	0.0	0.0	0.3	0.6	0.1	0.2	0.1	0.0	0.1	0.1	0.2	1.0	0.4	0.2	0.0	0.0	3.4	4.6- 4.9 T
L 11.1-12.0	0.0	0.0	0.4	0.4	0.1	0.2	0.1	0.0	0.1	0.1	0.3	0.9	0.3	0.2	0.0	0.0	3.1	5.0- 5.4 E
E 12.1-13.0	0.0	0.0	0.3	0.4	0.0	0.1	0.1	0.0	0.0	0.1	0.3	1.2	0.4	0.2	0.1	0.0	3.2	5.5- 5.8 R
S 13.1-14.0	0.0	0.0	0.3	0.3	0.0	0.1	0.1	0.0	0.0	0.1	0.3	1.4	0.5	0.4	0.1	0.0	3.6	5.9- 6.3 S
/ 14.1-15.0	0.0	0.0	0.2	0.3	0.0	0.1	0.1	0.0	0.0	0.1	0.2	1.4	0.4	0.3	0.1	0.0	3.1	6.4- 6.7 /
H 15.1-16.0	0.0	0.0	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.3	1.6	0.4	0.3	0.1	0.0	3.4	6.8- 7.2 S
O 16.1-17.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.6	0.4	0.4	0.1	0.0	3.2	7.3- 7.6 E
O 17.1-18.0	0.0	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	1.7	0.5	0.3	0.1	0.0	3.1	7.7- 8.0 C
U 18.1-19.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6	0.5	0.3	0.1	0.0	3.1	8.1- 8.5 O
R 19.1-20.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.8	0.4	0.4	0.0	0.0	3.2	8.6- 8.9 N
20.1-25.0	0.0	0.0	0.7	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.7	7.5	1.8	2.0	0.1	0.0	13.3	9.0-11.2 D
25.1-30.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	6.0	1.7	1.8	0.0	0.0	10.8	11.3-13.4
30.1-35.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.7	0.9	1.1	0.0	0.0	6.3	13.5-15.6
35.1-40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.6	0.4	0.5	0.0	0.0	3.7	15.7-17.9
>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	0.5	0.3	0.0	0.0	2.6	>17.9
CALM																	0.1	CALM
TOTAL	0.6	0.9	6.3	8.1	3.1	3.0	2.0	1.4	1.4	2.2	7.3	40.0	11.5	10.1	1.5	0.6	100.0	TOTAL
AV SPD (MPH)	7.2	7.9	13.4	9.1	5.9	7.1	7.6	6.5	6.5	7.9	14.5	21.9	19.9	21.5	10.4	6.4	17.0	AV SPD (MPH)
AV SPD (M/S)	3.2	3.6	6.0	4.0	2.7	3.2	3.4	2.9	2.9	3.5	6.5	9.8	8.9	9.6	4.7	2.9	7.6	AV SPD (M/S)

SOURCE: GORESEARCH, INC.

**Figure IV - 6**  
**Annual Wind Rose Distribution**  
**ANACONDA WEATHER HILL — DEER LODGE COUNTY**  
**(1976 - 1979)**



**Table IV - 58**  
**Coefficients of Weibull Distribution**  
**DEER LODGE COUNTY - ANACONDA WEATHER HILL**  
**12/04/76 - 05/31/79**

MONTH	SCALE FACTOR (C) (M/SEC)	SHAPE FACTOR (K)
JANUARY	9.6346	1.2677
FEBRUARY	9.4117	1.2555
MARCH	10.6592	1.3294
APRIL	8.1883	1.5939
MAY	9.0770	1.7469
JUNE	7.0264	1.7153
JULY	5.5180	1.4126
AUGUST	6.9648	1.3803
SEPTEMBER	8.5019	1.6952
OCTOBER	8.7946	1.4047
NOVEMBER	7.6801	1.0634
DECEMBER	11.6991	1.1168
YEAR	9.2157	1.4134

SOURCE: GEORESEARCH, INC.